THE DOWNSTREAM PRICE EFFECTS OF RISING OIL PRICES

Jeff Gaynor

The meteoric rise in oil prices has received a great deal of media coverage. The key issue is whether the spike in crude prices will jump-start general inflation. Answering this requires analysis of how much and how quickly oil prices affect downstream prices normally and in a variety of pricing climates.

The principal conduit for oil's entry into the U.S. economy is through refineries, which process crude into fuels and base petrochemicals. The United States has not been self-sufficient in crude oil since the first half of the 20th century, and has been subject to the vagaries of the world petroleum market and OPEC for the past 25 years. U.S. refineries currently use roughly the same amount of domestic crude petroleum as foreign product. Thus, OPEC's 1999 production cuts disrupted feedstock supply chains at the same time that prices skyrocketed.

EXHIBIT 1
Crude Oil and Refined Product Price Changes
(Percent changes)

	1997	1998	1999	2000
Acquisition Cost of Crude (Dollars/barrel)	$19.11	$12.58	$17.41	$25.45
Percent Change	-7.6	-34.2	38.4	46.1
PPI, Petroleum Refining	-2.6	-25.0	18.3	49.5
Ratio (a)	0.335	0.732	0.476	1.072
PPI, Gasoline	-1.1	-25.6	21.2	54.0
Ratio (a)	0.145	0.749	0.552	1.171
PPI, Kerosene-Type Jet Fuel	-5.4	-27.1	14.7	50.0
Ratio (a)	0.700	0.793	0.383	1.083
PPI, Light Fuel Oil	-7.3	-26.1	19.1	49.3
Ratio (a)	0.955	0.764	0.497	1.068
PPI, #2 Diesel, to End-Users	-5.8	-25.7	15.1	45.8
Ratio (a)	0.755	0.752	0.392	0.993
PPI, Heavy Fuel Oil (Residual)	-0.2	-26.7	18.5	58.3
Ratio (a)	0.024	0.782	0.481	1.264
Naphtha, Gulf Coast Spot	-3.1	-31.5	29.0	50.6
Ratio (a)	0.410	0.920	0.754	1.097

a. Ratio of change in downstream prices to change in average price paid for crude.

The first tier of products to bear the brunt of any oil price increase are fuels (e.g., gasoline, diesel, jet fuel) and base petrochemicals (e.g. ethylene, propylene). Exhibit 1 shows the yearly change in prices for oil-based fuels and naphtha (a petrochemical feedstock), as well as the U.S. refiners' composite acquisition price of crude oil (a weighted average of foreign and domestic crude). This composite price declined 7.6% in 1997 and 34.2% in 1998, before rising 38.4% in 1999. Thus, the effects on fuel prices from a strong decrease and increase in oil prices, as well as a fairly modest change, can be highlighted.

In percentage terms, prices for fuel and naphtha bore more of the impact of crude's price decline in 1998 than they have so far from the huge increase in 1999. They will make up for it in 2000, however, as prices for all but one downstream product snap back by more than the price of crude.

The greater increase in downstream prices in 2000 than in 1999 is somewhat deceptive. There are no large crude price increases yet to come; average prices will be greater this year than last because they will not be brought down by "weak" quarters. The first quarter of 1999, in which the rally in crude prices actually began, was weak overall and tugged down average prices across the entire year. Even though crude prices from this point forward will show only limited upward movement, the year-over-year increases will be significant.

The next place to look for the effects of oil's price surge is in industries heavily dependent on fuels, such as transportation. Exhibit 2 shows the percentage change in the petroleum costs and the refining producer price index versus selected transportation indexes. Changes in measured industry costs are given as well.

The rise in industry costs, spurred by the oil price rally, is straining transportation margins. Scheduled air cargo transportation will feel an acute margin squeeze this year, while pressure will be comparatively less severe for railroads and the trucking industry.

Exhibit 2
Crude Oil and Transportation Price Changes
(Percent Changes)

	1997	1998	1999	2000
Refiners' Acquisition Cost of Crude	-7.6	-34.2	38.4	46.1
PPI, Petroleum Refining	-2.6	-25.0	18.3	49.5
PPI, Railroads	0.6	1.2	-0.3	0.7
Costs	1.7	1.1	0.0	3.4
PPI, Trucking	2.9	3.0	3.4	2.6
Costs	3.6	-0.6	-1.0	5.5
PPI, Air Cargo Transportation	-1.3	-2.4	2.1	0.4
Costs	1.0	-4.4	3.0	11.8
CPI, Air Fares	3.5	3	6.6	7.8
Costs	4.5	1.7	-2.4	4.7

Commercial airlines will buck the trend, achieving increases in airfares at least as great as those in their costs. Although sometimes rescinded, fuel surcharges have become relatively common in the airline industry. Given recent load factors, airlines were in a position to boost fares anyway. Fuel surcharges simply have helped to facilitate (or justify, in the public's mind) a round of fare increases.

Harder to unravel is the effect of oil's price spike in markets for chemicals and synthetic materials. Many of these commodities utilize oil and closely associated products as feedstocks and fuel sources. Despite the close link to petroleum, many chemicals undergo capacity-driven boom/bust price cycles that can obscure the cost influences of market fundamentals.

EXHIBIT 3
Crude Oil and Chemical Price Changes
(Percent Changes)

	1997	1998	1999	2000
Refiners' Acquisition Cost of Crude	-7.6	-34.2	38.4	46.1
PPI, Petroleum Refining	-2.6	-25.0	18.3	49.5
PPI, Ethylene	15.2	-24.7	19.3	28.5
Costs	-0.4	-27.8	15.0	50.7
PPI, Propylene	10.4	-32.1	3.8	45.9
Costs	-0.8	-27.2	15.1	49.1
PPI, Plastic Resins & Materials	2.9	-9.6	1.0	11.8
PPI, Synthetic Rubber	-2.3	-1.7	-3.2	3.7
Costs	0.2	-5.1	-3.9	5.3
PPI, Industrial Chemicals	-0.2	-4.0	-2.1	7.5
PPI, Industrial Inorganic Chemicals	-0.3	-1.4	-3.7	3.0
Costs	-3.8	2.6	1.7	2.4
PPI, Industrial Organic Chemicals	-0.1	-2.3	0.7	12.6
Costs	8.8	-16.9	-0.7	26.4
PPI, Asphalt & Tar Paving Mixtures, etc.	5.0	0.4	1.5	4.5
Costs	10.0	-8.5	-7.1	31.5

Exhibit 3 shows the percentage change in the petroleum acquisition cost and refining producer price index versus selected chemical and related product indexes. Changes in industry costs are given for the non-aggregate indexes.

Overcapacity, together with sinking oil prices, battered petrochemical prices in 1998. Prices for ethylene and propylene, two key plastic feedstocks, fell sharply in that year. Much of the subsequent rise has been due to demand growth absorbing new capacity much more quickly than expected. Nonetheless, with new, albeit more restrained, capacity increases in 2000, base petrochemical prices will be unable to match the price increases of their oil-dominated feedstocks.

Not surprisingly, margin pressure will be greater this year in organic industrial chemicals (which includes petrochemicals such as ethylene) than in inorganic industrial chemicals. Organic chemicals are by definition carbon-based, and petroleum is a carbon-rich source of many chemicals. But the costs for inorganics will also jump in 2000 (2.4%), largely because the manufacture of certain chemicals (e.g., sodium chlorate) is very energy intensive. Overall industrial chemical prices will surge 7.5% in 2000, as organics prices soar 12.6% and inorganics prices climb 3.0%.

Prices for plastic resins will soar 11.8% in 2000, as key inputs such as ethylene post substantial price gains. Margin pressure will vary across plastics grades, however. Synthetic rubber will post an annual price increase for the first time since 1995, rising 3.7% this year. Costs will jump 5.3%, as oil-based price gains filter through ethylene, propylene, and styrene. Natural rubber, in a chronic price slump globally, will continue to limit price gains in synthetic grades. Strong building rates in 1998-99 underpinned several building material price increases, even with overall costs declining. Cooling construction markets will limit 2000 price growth, even as costs climb more rapidly. Manufacturers of asphalt and tar paving mixtures will be able to pass on only a fraction of their rising input costs.

A slight slowdown in real GDP growth was in the cards for 2000 even before the rise in oil prices. The deceleration in economic growth will mean that much of the impact of higher prices, at least in 2000, will be absorbed in manufacturers' margins. We therefore view the jump in oil prices as contributing a one-time jolt that will boost inflation this year. But we believe that further oil price increases are required for inflation rates to accelerate in 2001.